
Chapter 11 — ISL Implementation and Maintenance

Overview

This chapter provides the information needed to implement ISL on the Meridian 1 Option 11 system. It provides:

- hardware and software installation
- programming all components needed to provide basic call service

ISDN features are treated separately in the chapter devoted to ISDN feature implementation.

This chapter builds on the ESN programming that is assumed to be already in place. It is also built on the assumption that you have a basic understanding of NARS and CDP.

Two modes of ISL are available: shared and dedicated. This chapter covers ISL installation in dedicated mode using dedicated and leased lines. Shared mode installations are done according to the instructions supplied for PRI, with the noted exceptions.

ISL Hardware Requirements

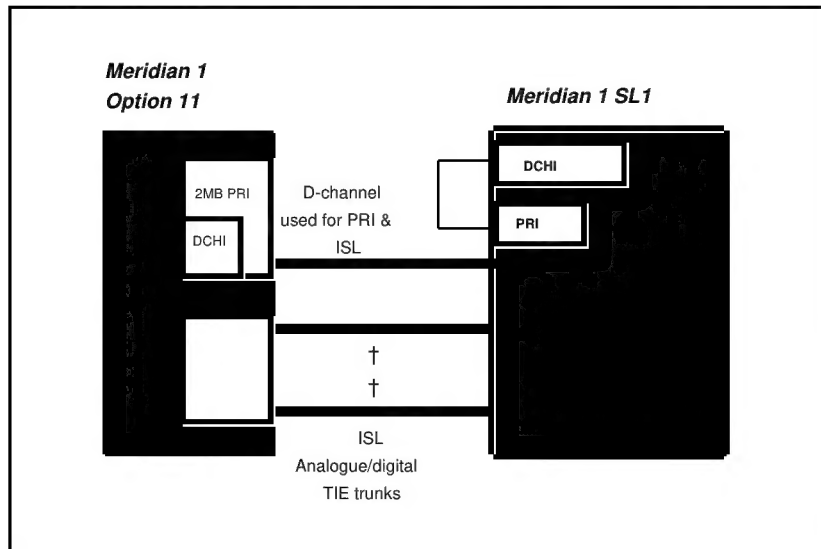
ISL, regardless of the mode of operation, uses analogue or digital TIE lines as B-channels.

ISL in Shared mode

In shared mode, PRI hardware is required in addition to the existing TIE lines interface cards.

- NT8D15 Analogue trunk card(s)
- NTAK02 SDI/DCH, NTAK10 2.0 Mb DTI, NTAK79 2.0 Mb PRI, or NTBK50 2.0 Mb PRI card(s)

Figure 80
ISL in Shared Mode:

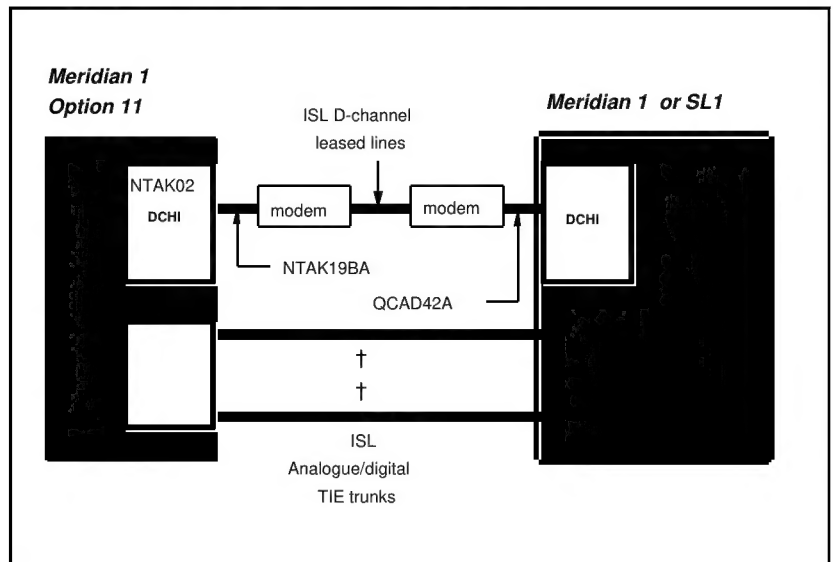


ISL in Dedicated Mode using Leased Line

The following hardware is required:

- NTAK02 SDI/DCH D-channel Handler Interface
- Modem capable of the following: (such as Ventel 2400-33 or 2400 Plus II)
 - minimum of 2400 baud
 - synchronous operation
 - must support leased line (also known as private line or point-to-point) operation
- NTAK19BA 4-Port SDI Cable

Figure 81
ISL in Dedicated Mode using Leased Line

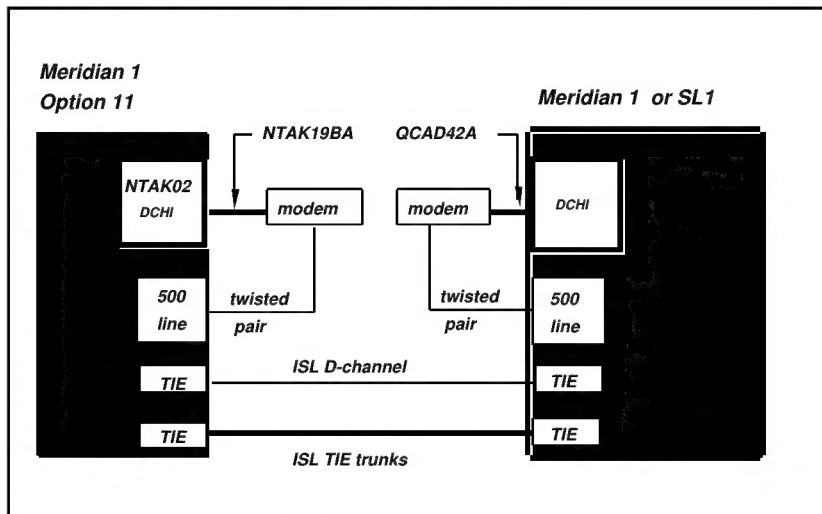


ISL in Dedicated Mode using Dial-up modem

The requirements are as follows:

- NTAK02 SDI/DCH D-channel Handler Interface
- Modems such as Ventel 2400, Hayes 2400 (the Hayes Smartmodem 2400 cannot be used on leased lines) or Gandalf 2400 that can support 2 or 4-wire leased line operation (4-wire operation must be specified when ordering otherwise modems are factory shipped for 2-wire operation).:
 - autodial capability
 - minimum of 2400 baud
 - synchronous operation
 - programmable so that one modem originates the call while the other auto-answers
- NTAK19BA 4 Port SDI Cable
- NT8D09 500 set line card

Figure 82
ISL in Dedicated Mode using Dial-up Modem



ISL hardware installation

Shared mode

The hardware installation is identical to the PRI installation, with the addition of analogue or digital TIE trunks (or both).

Dedicated mode

Step 1: Install the NTAK02.

The NTAK02 connects to the modem through the NTAK19BA four port cable. Only ports 1 and 3 are available for use as DCHIs.

- a Set option switches/jumpers on the DCHI card as shown below, for mode of operation (i.e. RS232 or RS422 and DTE or DCE)
- b Install the NTAK02 in any spare slot 1-9 of the main cabinet
- c Install the NTAK19BA four port cable on the 50 pin Amphenol connector associated with the slot holding the NTAK02.

NTAK02 switch settings

Port 0	Port 1	SW1-1	SW1-2
SDI	DCH	OFF	OFF
SDI	DPNSS1	OFF	ON
—	ESDI	ON	ON

Port 2	Port 3	SW1-3	SW1-4
SDI	DCH	OFF	OFF
SDI	DPNSS1	OFF	ON
—	ESDI	ON	ON

NTAK02 Jumper settings

Unit	Jumper location	Strap for DTE	Strap for DCE	Jumper location	RS422	RS232
Unit 0	J10	C - B	B - A			
Unit 1	J7	C - B	B - A	J9	C - B	B - A
	J6	C - B	B - A	J8	C - B	B - A
Unit 2	J5	C - B	B - A			
Unit 3	J4	C - B	B - A	J2	C - B	B - A
	J3	C - B	B - A	J1	C - B	B - A

Step 2: set up the D-channel

- a If this is a dedicated mode installation using leased line modems, the D-channel connects the DCHI with the far-end modem over a dedicated leased line. Synchronous modems with a minimum 2400 baud data rate must be configured. Modems must support leased line capability and synchronous mode. The Hayes Smartmodem 2400 cannot be used on leased lines
- b If this a dedicated mode using dial-up modems (modems such as Hayes 2400, Ventel 2400 or Gandalf 2400 can be used): in this configuration, the DCHI is connected to a modem which is connected to a 500 set line card. The call is connected to the far-end through the 500 set-to-TIE trunk path.

To set-up the D-channel, program the modem at one end in the auto-dial mode, so it automatically initiates a call to the other end at power up. The auto-dial number must be coordinated with the far end switch. The originate modem has this auto-dial number stored internally as part of the modem configuration routine.

The far-end modem need only be set-up for auto-answer.

ISL software programming

There are two modes of ISDN Signaling Link (ISL) operation, Shared mode and Dedicated mode.

Shared mode

The NTAK79 on-board DCHI supports ISDN PRI signaling and ISL trunks. The configuration is basically the same as the PRI D-channel, with the D-channel also supporting ISL trunks.

The DTI/PRI software programming sequence can be used (refer to the appropriate chapters for more information) with the following exceptions:

LD 17:

Prompt	Response	Description
USR	SHA	D-channel for ISL in "shared" mode, used for both ISDN PRI and ISL.
ISLM	1-240	number of ISL B-channel (trunks) controlled by the D-channel (no default value).

LD 16:

Prompt	Response	Description
IFC	SL1	interface type must be SL1 (this is the only type supported for ISL).
MODE	ISLD	TIE route used for ISL members.

LD 14:

Prompt	Response	Description
CHID	1-240	channel identifier for ISL channels. Must be coordinated with the far-end.

Dedicated mode

The DCHI uses the NTAK02 circuit card, and does not support ISDN PRI signaling. The DCHI is reserved for ISL use only. The D-channel can communicate with the far end by means of a dedicated leased line modem, or dial-up modem.

Note that the following programming relates to analogue TIE trunks being used as B-channels. In the case where DTI/PRI trunks are also used then LD 17 digital loop (2 Mb PRI) and LD73 (2 Mb PRI/SYTI) must also be configured with the appropriate clocking and threshold settings.

For ISL dedicated mode using a dial-up modem, a 500 set, TIE trunk route and member must be programmed (used for D-channel).

Configuring Basic ISL Capability

Step	Overlay	Action
1	LD 17 (CFN)	Configure the D-channel for ISL use.
2	LD 15 (CDB)	Enable ISDN option
3	LD 16 (RDB)	Enable the ISL option on a per route basis, assign a D-channel for each route
4	LD 14 (TDB)	Assign a channel identification to each trunk with the ISL option.

Step 1: Respond to the following prompts in Overlay 17.

Prompt	Response	Description
REQ	CHG	
TYPE	CFN	configuration data block
ADAN	NEW DCH 1-15	add primary D-channel
CTYP	DCHI	D-channel card type
CDNO	1-9	Card slot in which the card supporting the DCHI resides
PORT	1	must be set to 1
USR	PRI	D-channel for ISDN PRI only
IFC	SL1	Interface type
DCHL	1-9	PRI2 card number. (Must match entry for CDNO.)
SIDE	NET (USR)	Net: network, the controlling switch User: slave to controller
RLS	XX	X11 software release of far-end. This is the current software release of the far end. If the far end has an incompatible release of software, it prevents the sending of application messages, i.e. for Network Ring Again.
CLOK		D-channel clock type for signaling
	EXT	source of D-channel clock is external to DCHI card (in this case the DTI/PRI circuit card). Normally, EXT is used for PRI/ISL. Note: do not confuse this clock with the E1 span Clock Controller found on the NTAK10/79. This clock is in reference to the DCHI synchronous mode of operation. (Note: If directly connecting two DCHI ports with out the use of modems, set "CLOK" to "EXT" on one side and "INT" on the other).
LAPD	YES,(NO)	change LAPD parameters. Simply carriage return if timers are to be left at default value. The following timers are prompted only if LAPD is set to YES. The following can all be left at default during initial set-up.

Prompt	Response	Description
T23	1-(20)-31	interface guard timer checks how long the interface takes to respond. In units of 0.5 seconds (default 20 = 10 seconds).
T200	2-(3)-40	retransmission timer in units of 0.5 seconds (default 3 = 1.5 seconds).
N200	1-(3)-8	maximum number of retransmissions
N201	4(260)	maximum number of octets in information field
K	1-(7)-32	maximum number of outstanding unacknowledged frames (NAKS)

Step 2: Use Overlay 15 to enable the ISDN option.

Prompt	Response	Description
REQ	NEW,CHG	
TYPE	CDB NET_DATA	Customer Data Block Release 21 gate opener
CUST	0-31	customer number
ISDN	YES	customer is equipped with ISDN
PNI	1-32700	customer private network identifier. MUST be unique to this customer in the private network. Used as part of the setup message for feature operation such as Network Ring Again and Network ACD...
HNPA	NPA	telephone area code for this Meridian 1. Sent as part of setup message as CLID
HNXX	NXX	telephone local exchange code for this Meridian 1. Sent as part of setup message as calling line identification.
HLOC	XXX	home location code (NARS)
LSC	1-9999	one to four digit Local Steering Code established in the Coordinated Dialing Plan (CDP). The LSC prompt is required for Calling Line I.D. and Network ACD.
AC2		Access Code 2. Enter call types (type of number) that use access code 2. Multiple responses are permitted. This prompt only appears on NARS equipped systems. If a call type is not entered here, it is automatically defaulted to access code 1.
	NPA	E.164 National
	NXX	E.164 Subscriber
	INTL	International
	SPN	Special Number
	LOC	Location Code

Step 3: Use Overlay 16 to enable the ISL option on a per route basis.

Prompt	Response	Description
REQ	NEW,CHG	
TYPE	RDB	route data block
CUST	0-31	customer number
ROUT	0-127	route number
TKTP	TIE	TIE trunk route
DTRK	YES/NO	enter YES if this is a Digital Trunk Interface (DTI or PRI)
ISDN	YES	ISDN option
MODE	ISLD	Route for ISL application
DCHI	XX	DCHI port no. in CFN which will carry the D-channel for this TIE trunk route.
PNI	1-32700	customer private network identifier- must be the same as the CDB PNI at the far end.
IFC		interface type
	SLI	- select Meridian 1 to Meridian 1
CTYP	<CR>	Call Type. Enter the call type to be associated with the outgoing route for direct dialing using the trunk access code (instead of NARS access code) See the "X11 Software Guide - Including Supplementary Features" for a list of valid responses
INAC	YES	Insert Access Code. Permits the NARS AC1 or AC2 access code to be re-inserted automatically on an incoming ESN call.

Step 4: Respond to the following prompts in Overlay 14.

Prompt	Response	Description
REQ	NEW,CHG	
TYPE	TIE	TIE trunk type
TN	CC UU	Card (CC) and Unit (UU) to be associated with this trunk data
RTMB	RR MM	route (created in step 3) (RR) and member number (MM)
CHID	1-240	channel identifier for ISL channels (remove with Xnn)—must be coordinated with far end (no default value)

ISL maintenance

DCHI Quick Reference

Below is a quick reference list of D-channel commands (LD 96).

Command	Action
DIS DCHI N	disable DCHI port N
ENL DCHI N	enable DCHI port N
EST DCH N	establish D-channel N
PLOG DCHI N	print D-channel statistics log N
RLS DCH N	release D-channel N
SDCH DCH N	release a D-channel and switch D-channels
RST DCH N	reset D-channel N
STAT DCH (N)	print D-channel status (link status)
TEST-100/101	DCH tests
STAT SERV	Print the current service and service acknowledge message for DCHI N
ENL SERV N	enable service messages for DCHI N
DIS SERV N	disable service messages for DCHI N

Maintenance messages

D-channel status and error conditions are reported as DCH messages. These messages can be found in the Option 11 *Software Guide - Maintenance Messages*.

Maintenance testing

ISL Back to Back (without Modems)

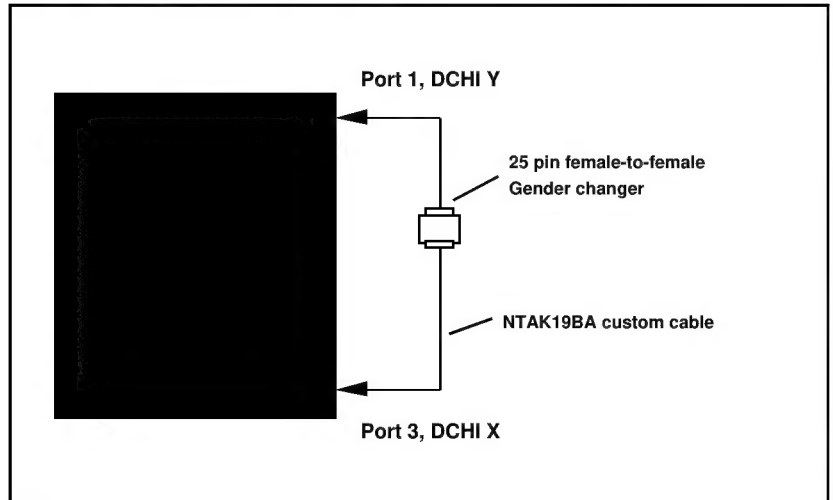
For maintenance reasons or testing purposes it is sometimes necessary to connect ISL back to back (without modems). This connection is normally done within the same Meridian 1 system in a lab environment.

Hardware requirements:

A 25-pin female-to-female gender changer is required to connect the NTAK19BA cable back-to-back. The gender changer is not supplied with the Option 11 system. Figure 83 illustrates the connection.

Note: Protocol converters AO378652 and AO381016 supplied with the system are not gender changers.

Figure 83
ISL back-to-back connection



Port settings:

— For port 3, DCHI X, program the following settings in LD 17:

- CLOK = INT (Internal clock)
- SIDE = SLAV (Slave)

Set NTAK02 port 3 jumper plugs to DCE and RS-422.

— For port 1, DCHI Y, program the following settings in LD 17:

- CLOK = EXT (External clock)
- SIDE = MAS (Master)

Set NTAK02 port 1 jumper plugs to DTE and RS-422.